

What is claimed is:

1. A thermal treatment equipment for heating a substrate using gas heated by a gas-heating unit as a heating source, comprising:

5 treatment rooms of n pieces ($n > 2$) for performing heat-treating, each having the gas-heating unit;
a preparatory heating room; and
a cooling room.

wherein a gas-supplying unit is connected to a gas charge port of the cooling room, a discharge port of the cooling room is connected to a first gas-heating unit
10 through a heat exchanger, a charge port of an m -th ($1 \leq m \leq (n-1)$) treatment room is connected to a discharge port of an m -th gas-heating unit, a charge port of an n -th treatment room is connected to a discharge port of an n -th gas-heating unit, a discharge port of the n -th treatment room is connected to the heat exchanger, and a discharge port of the heat exchanger is connected to a gas charge port of the
15 preparatory heating room.

2. A thermal treatment equipment according to Claim 1, wherein the gas is nitrogen or noble gas.

20 3. A thermal treatment equipment according to Claim 1, wherein the gas is reducing gas.

4. A thermal treatment equipment according to Claim 1, wherein the gas is oxidizing gas.

25 5. A thermal treatment equipment according to Claim 1, wherein the treatment room is formed of quartz or ceramic.

6. A method for thermal treatment comprising the step of:
30 heating a substrate by using gas heated by a heating unit as a heating source.

wherein the thermal treatment is performed by using a thermal treatment equipment comprising treatment rooms of n pieces ($n > 2$) each having the heating unit, a preparatory heating room, and a cooling room, gas heated by an m -th ($1 \leq m \leq (n-1)$) heating unit is supplied to an m -th treating room by treating rooms and gas-heating units of n pieces ($n > 2$), gas supplied to the m -th treatment room is heated by an $(m + 1)$ -th heating unit and is supplied to an $(m + 1)$ -th treatment room. substrates arranged at the treatment room of n pieces are heated, gas supplied to an n -th treatment room is supplied to a heat exchanger, gas supplied from a gas-supplying unit is used as a heating source for heating, gas supplied from the gas-supplying unit is supplied to the cooling room, gas discharged from the cooling room is supplied to a first gas-heating unit through the heat exchanger, and gas discharged from the heat exchanger is supplied to the preparatory heating room.

7. A method for thermal treatment according to Claim 6, wherein nitrogen or noble gas is used for the gas.

8. A method for thermal treatment according to Claim 6, wherein reducing gas is used for the gas.

9. A method for thermal treatment according to Claim 6, wherein oxidizing gas is used for the gas.

10. A thermal treatment equipment comprising:
treatment rooms of n pieces ($n > 2$) for performing heat-treating;
a preparatory heating room; and
a cooling room.

wherein a gas-supplying unit is connected to a gas charge port of the cooling room, a discharge port of the cooling room is connected to a first gas-heating unit through a heat exchanger, a charge port of an m -th ($1 \leq m \leq (n-1)$) treatment room is connected to a discharge port of an m -th gas-heating unit, a charge port of an n -th

treatment room is connected to a discharge port of an n-th gas-heating unit, a discharge port of the n-th treatment room is connected to the heat exchanger, and a discharge port of the heat exchanger is connected to a gas charge port of the preparatory heating room.

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11. A thermal treatment equipment according to Claim 10, wherein nitrogen or noble gas is used for the gas.

12. A thermal treatment equipment according to Claim 10, wherein reducing
10 gas is used for the gas.

13. A thermal treatment equipment according to Claim 10, wherein oxidizing gas is used for the gas.

15 14. A thermal treatment equipment according to Claim 10, wherein the treatment room is formed of quartz or ceramic.

15. A thermal treatment equipment comprising:
treatment rooms of n pieces ($n > 2$); and
20 gas-heating units of n pieces ($n > 2$),
wherein a charge port of an m-th ($1 \leq m \leq (n-1)$) treatment room is connected to a discharge port of an m-th gas-heating unit, a charge port of an n-th treatment room is connected to a discharge port of an n-th gas-heating unit, and a discharge port of the n-th treatment room is connected to a heat exchanger.

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16. A thermal treatment equipment according to Claim 15, wherein nitrogen or noble gas is used for the gas.

17. A thermal treatment equipment according to Claim 15, wherein reducing
30 gas is used for the gas.

18. A thermal treatment equipment according to Claim 15, wherein oxidizing gas is used for the gas.

5 19. A thermal treatment equipment according to Claim 15, wherein the treatment room is formed of quartz or ceramic.

20. A method for thermal treatment comprising the steps of:
introducing n substrates ($n > 2$) into treatment rooms of n pieces; and
10 heating the n substrates by gas-heating units of n pieces as heating sources,
wherein a charge port of an m -th ($1 \leq m \leq (n-1)$) treatment room is connected to a discharge port of an m -th gas-heating unit, a charge port of an n -th treatment room is connected to a discharge port of an n -th gas-heating unit, and a discharge port of the n -th treatment room is connected to a heat exchanger.

15 21. A method for thermal treatment according to Claim 20, wherein nitrogen or noble gas is used for the gas.

22. A method for thermal treatment according to Claim 20, wherein reducing
20 gas is used for the gas.

23. A method for thermal treatment according to Claim 20, wherein oxidizing gas is used for the gas.

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